1 Extra Material

1.1 $f_{\Lambda_b^0}/f_d$ data points

The measured values of $f_{\Lambda_b^0}/f_d$ in bins of p_{T} and η are given in Tables 1 and 2, respectively. $f_{\Lambda_b^0}/f_d$ is calculated as $\mathcal{R} \times \mathcal{S}$, where $\mathcal{R}$ is the efficiency corrected yield ratio. The data points correspond to those shown in Fig. 3 in the paper. In the above mentioned tables, the uncertainties only include the *uncorrelated* statistical uncertainties on the measured yields and efficiencies. For convenience, the information from Tables 1 and 2 can be found in the plain text files *flfd_datapoints_pt.txt* and *flfd_datapoints_eta.txt*.

1.2 Correlated uncertainties

In addition to the *uncorrelated* uncertainties shown in Tables 1 and 2, there are two sources of *correlated* uncertainty that contribute to the total uncertainty on $f_{\Lambda_b^0}/f_d$.

p_{T} bins [GeV/c]		
boundaries	mean	$f_{\Lambda_b^0}/f_d$
1.5 - 3.6	2.53	0.571 ± 0.015
3.6 - 4.5	4.04	0.543 ± 0.014
4.5 - 5.3	4.89	0.496 ± 0.012
5.3 - 6.0	5.64	0.510 ± 0.012
6.0 - 6.5	6.24	0.469 ± 0.012
6.5 - 7.0	6.74	0.424 ± 0.011
7.0 - 7.5	7.24	0.398 ± 0.010
7.5 - 8.0	7.74	0.484 ± 0.012
8.0 - 8.5	8.24	0.432 ± 0.011
8.5 - 9.0	8.74	0.406 ± 0.011
9.0 - 9.5	9.24	0.388 ± 0.010
9.5 - 10.0	9.74	0.390 ± 0.011
10.0 - 10.7	10.34	0.342 ± 0.008
10.7 - 11.5	11.08	0.344 ± 0.008
11.5 - 12.2	11.84	0.350 ± 0.010
12.2 - 13.0	12.58	0.371 ± 0.011
13.0 - 14.3	13.61	0.278 ± 0.007
14.3 - 16.0	15.08	0.277 ± 0.008
16.0 - 20.2	17.73	0.251 ± 0.006
20.2 - 40.0	24.85	0.214 ± 0.007

Table 1: $f_{\Lambda_b^0}/f_d$ in bins of p_{T} of the b hadron. The uncertainties include the statistical uncertainty on the measured yields. The systematic uncertainty and the uncertainties originating from the scale factor $\mathcal{S}$ are not included. The statistical uncertainty on the measured efficiency is treated as a systematic uncertainty.

η bins		
boundaries	mean	$f_{\Lambda_b^0}/f_d$
2.00 - 2.60	2.32	0.321 ± 0.006
2.60 - 2.75	2.68	0.359 ± 0.008
2.75 - 2.90	2.82	0.364 ± 0.007
2.90 - 3.05	2.97	0.386 ± 0.007
3.05 - 3.20	3.12	0.392 ± 0.007
3.20 - 3.35	3.27	0.400 ± 0.007
3.35 - 3.50	3.42	0.410 ± 0.008
3.50 - 3.65	3.57	0.366 ± 0.007
3.65 - 4.00	3.82	0.430 ± 0.006
4.00 - 5.00	4.41	0.483 ± 0.008

Table 2: $f_{\Lambda_b^0}/f_d$ in bins of η of the b hadron. The uncertainties include the statistical uncertainty on the measured yields. The systematic uncertainty and the uncertainties originating from the scale factor $\mathcal{S}$ are not included. The statistical uncertainty on the measured efficiency is treated as a systematic uncertainty.

- The systematic uncertainties on the measurement of $\mathcal{R}$ are treated as correlated between the bins. Tables 3 and 4 list all sources of systematic uncertainty on $f_{\Lambda_b^0}/f_d$ in bins of p_{T} and η bins, respectively, related to the measurement of $\mathcal{R}$. Also the systematic uncertainty due to the simulated sample size is given in these tables. This uncertainty is uncorrelated between the bins.

- The relative uncertainty on $f_{\Lambda_b^0}/f_d$ originating from the uncertainty on the scale factor $\mathcal{S}$ is $^{+7.7}_{-8.1}\%$. This uncertainty includes both the statistical and the systematic uncertainty, and is fully correlated between the bins.

Table 3: Different sources of systematic uncertainty on $f_{\Lambda_b^0}/f_d$ in bins of the $p_{\rm T}$ of the b hadron. The uncertainties listed in this table originate from the measurement of $\mathcal{R}$.

	Uncertainty									
$p_{\rm T}$ [GeV/c] of the b hadron	1.5 - 3.6	3.6 - 4.5	4.5 - 5.3	5.3 - 6.0	6.0 - 6.5	6.5 - 7.0	7.0 - 7.5	7.5 - 8.0	8.0 - 8.5	8.5 - 9.0
Fitmodel: signal shape										
$\alpha_1 - 10\%$	0.30 %	0.14 %	0.07 %	0.23 %	0.02 %	0.15 %	0.13 %	0.18 %	0.14 %	0.22 %
$\alpha_1 + 10\%$	-0.22 %	-0.05 %	0.02 %	-0.13 %	0.06 %	-0.01 %	-0.02 %	-0.14 %	0.04 %	-0.10 %
$\alpha_2 - 10\%$	0.03 %	-0.02 %	0.03 %	0.03 %	-0.04 %	0.07 %	0.06 %	-0.02 %	0.04 %	-0.00 %
$\alpha_2 + 10\%$	-0.01 %	0.02 %	-0.01 %	0.01 %	0.05 %	-0.02 %	-0.03 %	-0.04 %	0.01 %	0.01 %
$n_1 - 10\%$	0.05 %	0.00 %	-0.02 %	0.02 %	-0.04 %	-0.00 %	0.00 %	-0.02 %	-0.01 %	0.01 %
$n_1 + 10\%$	-0.03 %	0.03 %	0.05 %	0.03 %	0.05 %	0.06 %	0.04 %	-0.03 %	0.07 %	0.00 %
$n_2 - 20\%$	0.02 %	0.00 %	0.02 %	0.02 %	-0.00 %	0.04 %	0.02 %	-0.02 %	0.02 %	-0.00 %
$n_2 + 20\%$	0.00 %	0.02 %	0.00 %	0.02 %	0.01 %	0.02 %	0.01 %	-0.03 %	0.04 %	0.01 %
Double Gauss	-0.09 %	0.03 %	-0.07 %	0.15 %	-0.03 %	0.13 %	0.03 %	0.06 %	0.15 %	0.08 %
Fitmodel: background shapes										
comb +50% - -50%	0.14 %	0.00 %	0.16 %	0.11 %	0.15 %	0.20 %	0.08 %	0.09 %	-0.01 %	0.01 %
comb -50% - +50%	0.73 %	0.33 %	0.39 %	0.47 %	0.09 %	0.24 %	0.22 %	0.03 %	0.13 %	0.02 %
$B^0 \to D^{*-}\pi^+$ shape	0.19 %	0.08 %	0.01 %	0.11 %	0.05 %	-0.02 %	0.09 %	-0.07 %	0.07 %	0.06 %
part reco shape in $\Lambda_b^0 \to \Lambda_c^+\pi^-$	0.13 %	0.12 %	0.16 %	0.01 %	0.03 %	0.15 %	0.15 %	0.02 %	0.14 %	-0.07 %
$B^0 \to D^-\pi^+$ shape fix in $\Lambda_b^0 \to \Lambda_c^+\pi^-$	0.04 %	-0.00 %	0.03 %	-0.10 %	-0.11 %	0.03 %	0.04 %	-0.06 %	-0.06 %	-0.09 %
Charmless background	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %
Efficiencies										
PID	0.74 %	-3.47 %	-2.02 %	1.61 %	-0.99 %	-2.25 %	0.78 %	-2.36 %	-2.89 %	0.43 %
Trigger	±0.2%	±0.2 %	±0.3 %	±0.3 %	±0.4 %	±0.3 %	±0.4 %	±0.4 %	±0.4 %	±0.5 %
BDTmin	-5.854 %	-1.441 %	-1.640 %	-2.928 %	-1.887 %	-1.321 %	-2.407 %	-1.024 %	-4.563 %	-1.799 %
BDTplus	5.854 %	1.441 %	1.640 %	2.928 %	1.887 %	1.321 %	2.407 %	1.024 %	4.563 %	1.799 %
MC statistics	±5.25 %	±5.45 %	±4.90 %	±4.68%	±5.16 %	±4.74 %	±4.60 %	±5.15 %	±5.05 %	±4.78 %

	Uncertainty									
$p_{\rm T}$ [GeV/c] of the b hadron	9.0 - 9.5	9.5 - 10.0	10.0 - 10.7	10.7 -11.5	11.5 - 12.2	12.2 -13.0	13.0 - 14.3	14.3 - 16.0	16.0 - 20.2	20.2 - 40.0
Fitmodel: signal shape										
$\alpha_1 - 10\%$	0.17 %	0.19 %	0.31 %	0.27 %	0.40 %	0.61 %	0.40 %	0.57 %	0.34 %	0.28 %
$\alpha_1 + 10\%$	0.01 %	0.06 %	-0.16 %	-0.11 %	-0.15 %	-0.43 %	-0.20 %	-0.22 %	-0.16 %	-0.15 %
$\alpha_2 - 10\%$	0.05 %	0.05 %	-0.04 %	-0.05 %	0.01 %	-0.10 %	-0.02 %	-0.02 %	-0.06 %	0.06 %
$\alpha_2 + 10\%$	0.03 %	0.01 %	0.00 %	-0.02 %	0.01 %	0.06 %	-0.04 %	0.07 %	-0.03 %	-0.09 %
$n_1 - 10\%$	0.03 %	-0.00 %	0.01 %	-0.01 %	0.05 %	0.10 %	0.03 %	0.10 %	-0.03 %	-0.05 %
$n_1 + 10\%$	0.06 %	0.08 %	-0.04 %	-0.04 %	-0.01 %	-0.10 %	-0.04 %	-0.01 %	-0.04 %	-0.01 %
$n_2 - 20\%$	0.04 %	0.03 %	-0.02 %	-0.02 %	0.01 %	-0.04 %	-0.02 %	0.02 %	-0.04 %	-0.00 %
$n_2 + 20\%$	0.04 %	0.03 %	-0.01 %	-0.03 %	0.01 %	0.02 %	-0.02 %	0.04 %	-0.04 %	-0.06 %
Double Gauss	-0.02 %	0.09 %	-0.03 %	-0.04 %	0.04 %	-0.02 %	0.15 %	0.13 %	0.25 %	0.30 %
Fitmodel: background shapes										
comb +50% - -50%	0.53 %	0.39 %	0.26 %	0.02 %	0.06 %	0.02 %	0.07 %	0.09 %	0.00 %	-0.57 %
comb -50% - +50%	1.93 %	1.25 %	0.49 %	0.31 %	0.05 %	0.02 %	-0.01 %	0.04 %	0.14 %	-0.01 %
$B^0 \to D^{*-}\pi^+$ shape	-0.08 %	-0.07 %	0.08 %	0.01 %	0.09 %	0.02 %	-0.07 %	-0.04 %	-0.07 %	0.40 %
part reco shape in $\Lambda_b^0 \to \Lambda_c^+\pi^-$	0.31 %	0.24 %	0.51 %	0.31 %	-0.14 %	0.12 %	0.55 %	1.14 %	0.98 %	2.22 %
$B^0 \to D^-\pi^+$ shape fix in $\Lambda_b^0 \to \Lambda_c^+\pi^-$	0.15 %	0.11 %	0.27 %	0.08 %	-0.17 %	-0.15 %	0.09 %	0.58 %	-0.18 %	1.33 %
Charmless background	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %
Efficiencies										
PID	-0.62 %	-4.66 %	0.35 %	0.21 %	-4.45 %	-3.41 %	-1.78 %	-2.75 %	-0.53 %	-1.77 %
Trigger	±0.4 %	±0.4 %	±0.4 %	±0.4 %	±0.4 %	±0.4 %	±0.3 %	±0.3 %	±0.2 %	±0.1 %
BDTmin	0.615 %	-2.284 %	2.084 %	-0.283 %	-1.824 %	0.867 %	0.660 %	1.085 %	-0.861 %	0.242 %
BDTplus	-0.615 %	2.284 %	-2.084 %	0.283 %	1.824 %	-0.867 %	-0.660 %	-1.085 %	0.861 %	-0.242 %
MC statistics	±4.91 %	±5.00 %	±4.36 %	±4.08 %	±4.87 %	±5.28 %	± 3.92 %	±4.40 %	±3.75 %	±4.27 %

Table 4: Different sources of systematic uncertainty on $f_{\Lambda_b^0}/f_d$ in bins of the η of the b hadron. The uncertainties listed in this table originate from the measurement of $\mathcal{R}$.

	Uncertainty									
η of the b hadron	2.00 - 2.60	2.60 - 2.75	2.75 - 2.90	2.90 - 3.05	3.05 - 3.20	3.20 - 3.35	3.35 - 3.50	3.50 - 3.65	3.65 - 4.00	4.00 - 5.00
Fitmodel: signal shape										
$\alpha_1 - 10\%$	0.64 %	0.56 %	0.41 %	0.41 %	0.32 %	0.30 %	0.24 %	0.13 %	0.07 %	0.02 %
$\alpha_1 + 10\%$	-0.34 %	-0.34 %	-0.20 %	-0.21 %	-0.08%	-0.12 %	-0.09%	-0.03 %	0.00 %	0.03 %
$\alpha_2 - 10\%$	-0.02 %	0.07 %	0.02 %	0.08 %	0.03 %	-0.00 %	0.01 %	-0.02 %	-0.03%	-0.04 %
$\alpha_2 + 10\%$	0.03 %	-0.07 %	-0.02 %	-0.05 %	0.02 %	0.02 %	-0.02%	-0.01 %	0.01 %	0.02 %
$n_1 - 10\%$	0.13 %	0.13 %	0.06 %	0.07 %	0.07 %	0.03 %	0.00 %	-0.02 %	-0.04%	-0.05 %
$n_1 + 10\%$	-0.05 %	-0.09 %	-0.05 %	-0.03 %	0.01 %	-0.01 %	0.00 %	0.00 %	0.03 %	0.03 %
$n_2 - 20\%$	-0.00 %	0.02 %	-0.00 %	0.03 %	0.02 %	0.00 %	0.00 %	-0.02 %	-0.00%	-0.00 %
$n_2 + 20\%$	0.03 %	-0.01 %	0.00 %	0.00 %	0.02 %	0.01 %	-0.01%	-0.01 %	-0.01%	-0.01 %
Double Gauss	0.23 %	0.07 %	-0.02 %	0.01 %	0.06 %	0.09 %	0.03 %	-0.02 %	0.10 %	-0.11 %
Fitmodel: background shapes										
comb +50% - -50%	0.53 %	0.39 %	0.26 %	0.02 %	0.06 %	0.02 %	0.07 %	0.09 %	0.00 %	-0.57 %
comb -50% - +50%	1.93 %	1.25 %	0.49 %	0.31 %	0.05 %	0.02 %	-0.01%	0.04 %	0.14 %	-0.01 %
$B^0 \to D^{*-}\pi^+$ shape	-0.02 %	0.03 %	0.02 %	-0.00 %	-0.01%	0.04 %	0.01 %	0.02 %	0.10 %	0.46 %
part reco shape in $\Lambda_b^0 \to \Lambda_c^+\pi^-$	0.02 %	0.03 %	-0.11 %	0.33 %	-0.02%	0.02 %	0.26 %	0.35 %	0.16 %	0.12 %
$B^0 \to D^-\pi^+$ shape fix in $\Lambda_b^0 \to \Lambda_c^+\pi^-$	-0.77 %	-0.32 %	-0.28 %	0.10 %	-0.17%	-0.22 %	0.12 %	0.12 %	0.05 %	0.02 %
Charmless background	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %
Efficiencies										
PID	-1.74 %	-4.59 %	-2.32 %	-3.03 %	-1.02 %	-1.47 %	-1.36 %	-1.41 %	-0.25 %	3.33 %
Trigger	$\pm$0.4 %	$\pm$0.3 %	$\pm$0.4 %	$\pm$0.4 %	$\pm$0.4 %	$\pm$0.3 %	$\pm$0.3 %	$\pm$0.3 %	$\pm$0.3 %	$\pm$0.3 %
BDTmin	-0.887 %	-1.027 %	-1.387 %	-1.105 %	-1.223 %	-1.695 %	-1.017 %	-0.531 %	-2.212 %	-2.244 %
BDTplus	0.887 %	1.027 %	1.387 %	1.105 %	1.223 %	1.695 %	1.017 %	0.531 %	2.212 %	2.244 %
MC Satistics	$\pm$2.94 %	$\pm$3.77 %	$\pm$3.48 %	$\pm$3.40 %	$\pm$3.45 %	$\pm$3.54 %	$\pm$3.72 %	$\pm$3.60 %	$\pm$2.96 %	$\pm$3.76 %

1.3 $f_{\Lambda_b^0}/f_d$ comparison

A comparison of the present measurement of $f_{\Lambda_b^0}/f_d$ to the semileptonic measurement is provided in Fig. 1.

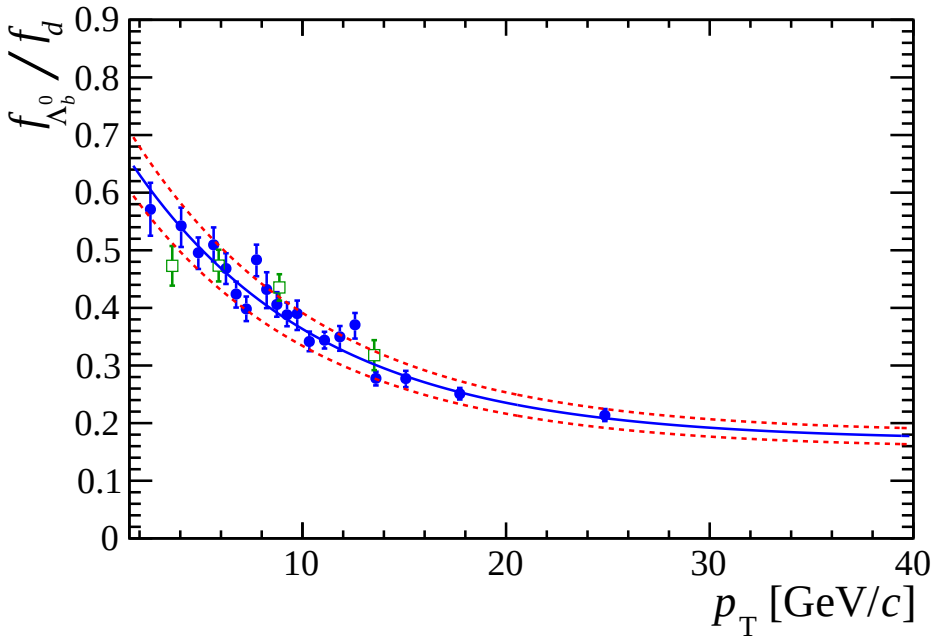

Figure 1: Dependence of $f_{\Lambda_b^0}/f_d$ on the p_{T} of the b hadron. The green (open square) data points show the semileptonic measurement. Only the statistical uncertainty is included. The blue (solid circle) data points show the hadronic measurement, and include both the statistical and systematic uncertainty. The red lines indicate the uncertainty on the scale of $f_{\Lambda_b^0}/f_d$ from the semileptonic measurement.